DETAILED ACTION

Response to Amendment

1. Based upon the submitted pre-appeal brief conference, the examiner withdraws the previous final rejection and issues a new non-final rejection based on newly discovered prior art.

2. Examiner notes patent to Harnett (USRE39051E) that discloses using a fuzzy inference system to match impedances.

3. The examiner notes the included interview summary which describes examiner's proposed amendments.

Claim Rejections - 35 USC § 103

1. **Claims 1-5,9-18** rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US2004/0101130A1), and further in view of Altekar at al. (US 20040022308 A1), and further in view of Jeffery et al. (6970905).

As per **claim 1,** Shi discloses a system comprising a signal generator (inherently comprised in Xmit path 62 in Fig. 9D to provide the transmitted stimulus disclosed in page 11 paragraph 121), impedance mismatch hardware (switches 82a,82b,86a,86b) coupled to impedances R4,R3 in Fig. 9D), and a controller (DSP disclosed in page 12 paragraph 130) is

used to measure subscriber loop characteristics to determine DSL capability (page 1 paragraph 3). Shi's system functions to maximize the received signal (para. 28), and uses the delay between the transmitted and received signals to determine the loop length (para. 26,27,38). Shi discloses the known problem of test signal attenuation and discloses modifying the impedance of the hybrid in order to reduce the attenuation of the echo signals perform loop calibration. However, Shi does not disclose that the DSP implements a fuzzy inference system to adjust an impedance value in order to maximize the echo signal when performing a loop qualification.

Altekar teaches an adaptable hybrid and teaches that the impedance of the hybrid may be varied in order to increase or decrease the echo for a desired application (para. 27). It would have been obvious to one of ordinary skill in the art at the time of this application to implement an adaptable impedance in order to increase the echo to an optimized value (maximal value) for the purpose of overcoming the disclosed problem of test signal echo attenuation during loop qualification.

Jeffery discloses a DSL system that monitors and analyzes measured conditions on the DSL line, including cable impedance and signal to noise ratio. Jeffery teaches that specialized logic, such as Fuzzy Logic may be used by the system in order to select the optimum configuration for the DSL modem (Col 15 lines 1-15). It would have been obvious to one of ordinary skill in the art at the time of this application to implement fuzzy logic in the controller of Shi and Altekar for the purpose of providing the optimum configuration and results for the DSL tests. The DSP of Shi and Altekar, when operating with fuzzy logic will be a fuzzy inference system.

As per **claim 10,** claim rejected for the same reasons as claim 1. FDR and TDR methods use the echo delay is used to determine the loop characteristics (page 11 paragraphs 119,121).

As per **claim 14,** it is rejected for the same reasons as claim 10. The DSP (page 11 paragraph 119) inherently comprises software for the purpose of controlling the hardware. The DSP controller of Shi in view of Jeffery's teachings, is a fuzzy inference system that adjusts the impedance seen by reflected signals by activating or deactivating (via switches) the hybrid or termination circuitry. This will function to modify the received signals because the impedance will be different.

As per **claim 2,** the impedance comprises a resistance (R3,R4).

As per **claim 3,** the system comprises an active termination impedance (page 11 paragraph 120).

As per **claim 4,** the receive signal the echo measured in either the FDR, or TDR method) is modified when the active termination impedance and hybrid are activated or deactivated (page 11 paragraphs120-124).

As per **claims 5,9,** the FDR and TDR tests measure the loop length and impedance which determine the ability to run a DSL on the loop (page 11 paragraph 119).

As per **claims 7,** the DSP controller is a fuzzy inference system that adjusts the impedance seen by reflected signals by activating or deactivating (via switches) the

hybrid or termination circuitry. This will function to modify the received signals because the impedance will be different.

As per **claim 8,** FDR and TDR methods use the echo delay is used to determine the loop characteristics (page 11 paragraphs 119,121). The amplitudes and time delay of the reflected signals is measured (page 11 paragraph 121).

As per **claims 11,15,** claim rejected for the same reasons as claims 6-8.

As per **claim 12,** claim rejected for the same reasons as claim 5. Additionally loop taps may be determined via measurements of standing waves. The resonant frequencies will indicate loop taps (impedance mismatches), and the loop length, which itself is a determination of the loop impedance, which is an indication of the insertion loss.

As per **claim 13,** the loop characterisitics are used to measure subscriber loop characteristics to determine DSL capability (page 1 paragraph 3).

As per **claims 16-18,** claim rejected for the same reasons as claims 8,12,13.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

/Alexander Jamal/

Primary Examiner, Art Unit 2614

Examiner Alexander Jamal

May 8, 2008

/Curtis Kuntz/
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